



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## PROBLEMS FOR SOLUTION.

### ALGEBRA.

269. Proposed by O. E. GLENN, Ph. D., Springfield, Mo.

Express the hyperbolic functions of  $x$  in the form of infinite continued fractions.

270. Proposed by C. N. SCHMALL, College of the City of New York, New York City.

Two ferry-boats started simultaneously from opposite sides of a river and one being faster than the other, they met 720 yards from the shore. Each boat remained 10 minutes in its slip to change passengers and started on its return trip, when it was found that they met again 400 yards from the other shore. What is the width of the river?

### CALCULUS.

221. Proposed by REV. R. D. CARMICHAEL, Hartselle, Ala.

Find  $\lim_{x \rightarrow 0} \tan^{-1} x (\log x)$ .

222. Proposed by REV. R. D. CARMICHAEL, Hartselle, Ala.

If  $s_n = 2 \left( \frac{1}{n} - \frac{2}{2n^3} + \frac{1}{5n^5} + \frac{1}{7n^7} - \frac{2}{9n^9} + \frac{1}{11n^{11}} + \dots \right)$  prove that

$$\begin{aligned} \log 3 &= s_3 + s_4, \\ \log 7 &= s_2 + s_3 + s_4, \\ \log 13 &= s_2 + 2s_3 + s_4. \end{aligned}$$

223. Proposed by O. E. GLENN, Ph. D., Springfield, Mo.

Prove that  $\lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n \lambda^k}{n^{k+1}} = \frac{1}{k+1}$ .

224. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

Prove that  $\int_0^\infty \tan^{-1}(\tan a \sin x) \frac{dx}{x} = \frac{1}{2} \pi \log (\tan a + \sec a)$ .

### GEOMETRY.

295. Proposed by S. F. NORRIS, Professor of Mathematics, Baltimore City College, Md.

One side and the opposite angle of a triangle are fixed. Find the locus of the center of the inscribed circle. Solve by methods of analytic geometry.

296. Proposed by J. J. QUINN, Ph. D., Warren, Pa.

Given  $AB \perp BC$  perpendicular to each other, and  $E$  and  $M$  their mid-points, respectively. On  $AB$  describe a semi-circle, and draw  $CE$  to meet the circumference in  $D$ . Draw  $DM$  cutting  $AB$  in  $F$ . In what ratio is  $AB$  divided by the point  $F$ ?